FUELING NOZZLE DEVICE

FIELD OF THE INVENTION

[0001] The present invention relates in general to fuel pump nozzles and more particularly to a device having structure for reducing the occurrence of fuel spills at fuel pumping stations, caused by nozzles that inadvertently fall from fuel inlets of vehicles, during fueling.

BACKGROUND OF THE INVENTION

[0002] Fuel spills that occur at automobile fueling stations are hazardous to the safety of individuals at or near the fueling station and to the environment. Fuel spills at fuel stations used by trucks in the trucking industry are common and in some cases, involve a large volume of fuel spilled. Clearly large volume fuel spills are extremely hazardous and can result in a loss of revenue.

[0003] Fuel spills at stations used in the trucking industry are generally the result of a nozzle being left unattended during pumping. Drivers commonly leave fuel nozzles unattended during filling due to the time required to fuel a large truck. In many cases, the fuel pump, the fuel line from the pump and the nozzle at the end of the fuel line are all in working order and have no defects. Thus, such spills are caused by other factors. For example, when fueling a truck, it is common for a driver to walk away from the truck or to attend to other matters around the truck. When left unattended, the spout portion of the nozzle then dislodges from the fuel inlet of the truck. This occurs for many reasons including, for example, due to accidental interference by the driver of the truck by inadvertently knocking or bumping the fuel line leading to the nozzle, due to wind that moves the fuel line and thereby moves the nozzle, due to changes in pressure that commonly occur at multi-fueling point stations or due to back pressure from the tank as the volume of fuel in the tank increases.

[0004] To reduce the occurrence of such spills at truck fueling sites, laws have been introduced requiring all persons fueling vehicles to be in attendance at the fueling point during fueling. Such laws however, are difficult to enforce.

[0005] To prevent persons from walking away from the pump during filling, hold-open clips that were present on the handle portion on 7H style nozzles in the past, are no longer available at truck fueling stations. These hold-open clips allow the driver to engage the clip

to hold the trigger of the nozzle in the open position, without having to maintain hand contact with the trigger. The removal of these hold-open clips has not prevented drivers from leaving fuel pumps unattended during fueling, however. Foreign objects are commonly jammed into the handle of the nozzle to force the trigger into the open position and therefore allow the driver to leave the pump unattended during fueling.

[0006] Because, many drivers continue to walk away from the fueling point during fueling of their trucks, it is desirable to inhibit a nozzle from becoming dislodged from a fuel inlet of truck in the case that the fueling point is left unattended.

SUMMARY OF THE INVENTION

[0007] In one aspect of the present invention, there is provided a device for use with a fueling nozzle including a handle assembly and a spout, the device includes a connection component for coupling to the fueling nozzle, proximal the spout, and a resilient member extending from the connection component. When in use, the connection component is coupled to the fueling nozzle and the resilient member extends into a fuel inlet of a vehicle, along with the nozzle. The resilient member thereby biases the nozzle against a side of the fuel inlet.

[0008] In another aspect of the present invention, there is provided a fueling nozzle for use with a fuel pump and hose in fueling vehicles. The fueling nozzle includes a handle assembly including a handle portion having a fluid path in fluid communication with a hose from the pump, and a trigger in communication with the handle portion. The trigger is actuatable for causing fuel flow through the fluid path when in use. A spout extends from the handle portion. The spout is in fluid communication with the handle portion for flow of fuel from the hose through the handle portion and out the spout. A resilient member is coupled to one of the spout and the handle assembly and extends therefrom. When the nozzle is in use, the resilient member extends into the fuel inlet for abutting the fuel inlet and biasing the spout into contact with the fuel inlet.

[0009] Several advantages are realized in aspects of embodiments of the present invention. For example, the pump nozzle device provides an inexpensive way to aid in inhibiting nozzles from inadvertently falling from a fuel inlet of a vehicle. Also, the design permits use of the nozzle device with many different tank styles or different nozzles. Energy due to movement of the nozzle during filling is absorbed by the nozzle device. Other advantages also include improved grounding of the vehicle to the pump and reduced wear of

the spout of the nozzle. Also, with the device in a non-use position, the device protects the plastic head cap at the top of the nozzle. If damaged, the head cap allows air in to the fuel tank and therefore does not provide a vacuum state in the tank. The vacuum state is desired in order for the automatic shut off on the fuel pump to work. Thus, protection of head cap is desirable.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The invention will be better understood with reference to the drawings and the following description, in which:

Figure 1 is a perspective view of a device for use with a fueling nozzle, showing a resilient member in a first position, according to an embodiment of the present invention;

Figure 2 is a side view of the device of Figure 1, installed on a nozzle, with the device in a use position;

Figure 3 is a side view of the device installed on the nozzle of Figure 2, with the device in a non-use position;

Figure 4 is a side view of the device installed on the nozzle of Figure 2, with the device in the use position and the device and nozzle inserted into a fuel inlet, the fuel inlet shown in section; and

Figure 5 is a perspective view of the device installed on the nozzle of Figure 4, with the nozzle device in a use position and the device and nozzle inserted into a fuel inlet.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0011] Reference is first made to figure 1 to describe a device for use with a fueling nozzle (not shown in Figure 1), the device being indicated generally by the numeral 20. The device 20 includes a connection component 22 for coupling to the fueling nozzle, proximal a spout thereof. The device 20 also includes a resilient member 24 extending from the connection component 22. When in use, the connection component 22 is coupled to the fueling nozzle and the resilient member 24 extends into a fuel inlet of a vehicle (not shown), along with the nozzle. The resilient member 24 thereby biases the nozzle against a side of the fuel inlet.

[0012] The device 20 will now be described in more detail. As shown in Figure 1, the device 20 includes the connection component 22 that has a collar 26 and a mounting plate

28. The collar 26 is generally cylindrically shaped and is sized to fit snugly around a standard spout of a fueling nozzle. The mounting plate 28 is welded to and extends outwardly from a portion of one end of the collar 26. The mounting plate 28 includes a pair of bolt holes 32 that are sized and spaced to match a bolt pattern on a face of the nozzle that is near the junction between the spout and a handle assembly of the nozzle. Clearly the bolt holes 30 in the mounting plate 28 are used for mounting the device 20 to the nozzle.

[0013] The device 20 also includes the resilient member 24 that extends from the collar 26. The resilient member 26 is fixed to the collar 26 via first and second chain linkages 32, 34, respectively. The first chain linkage 32 is welded to the collar 26 and the second chain linkage 34 welded to the resilient member 26. Clearly the first and second chain linkages 32, 34, respectively are coupled to each other and hinge about an axis 36. Thus, the resilient member 24 is fixed to the collar 26 and is movable between a first position that is best shown in Figure 2 and a second position that is best shown in Figure 3.

[0014] Rather than extending straight from the collar 26, the resilient member 24 includes a number of bends therein. In the present embodiment, the resilient member 24 includes first second and third sections 38, 40, 42, respectively. As best shown in Figure 1, the first and third sections 38, 42, respectively are generally parallel and a separated by the second section 40 that extends therebetween. Clearly the second section 40 extends at an obtuse angle to both the first and third sections 38, 42, respectively.

[0015] Each of the first and second sections 38, 40, respectively, include ribs 44 that protrude from the resilient member 24 and extend across the width thereof. A rounded bump 46 protrudes from the third section 42 of the resilient member, proximal an end thereof. The use and function of the ribs 44 and rounded bump 46 will be more fully explained below.

[0016] In the present embodiment, all portions of the device 20 are made of stainless steel that is TIG welded and the resilient member is tempered. Other suitable materials and manufacturing methods are possible.

[0017] Referring now to Figures 2 and 3, perspective views of the device 20 installed on a nozzle are shown. The nozzle is indicated generally by the numeral 50. As shown, the nozzle 50 includes a handle assembly 52 for connection at one end to a fuel line hose, and a spout 54 connected to a second end of the handle assembly 52. The handle assembly 52 has a handle portion 56 for grasping during pumping, through which a fluid path is provided. The fluid path connects the fuel line hose and the spout 54 in fluid communication. A trigger 58 is connected to the handle portion 56 and operates a valve in the fluid path for controlling

fuel flow through the fluid path. As will be appreciated, the trigger 58 is actuated during fueling to cause fuel flow through the fluid path and out the spout 54.

[0018] Referring still to Figures 2 and 3, the device 20 is connected to the nozzle 50 by sliding the spout 54 through the collar 26 and then moving the collar 26 up the spout 54. Next, connecting bolts (not shown) are located through the bolt holes 30 of the mounting plate 28 and into bolt holes on a face 60 of the nozzle 50 that is near the junction between the spout 54 and the handle assembly 52. As previously indicated, the bolt holes 32 through the mounting plate 28 are sized and spaced to match the bolt pattern on the face 60, providing a convenient attachment for the device 20 on the nozzle 50.

[0019] As described above, the resilient member 24 is movable by hinging about the chain linkages 32, 34, between a first position, also referred to as a use position (shown in Figure 2) and a second position, referred to as a non-use position (shown in Figure 3). When in the use position, the resilient member 24 extends generally in the direction of the spout 54, although clearly the resilient member 24 does not follow the exact contour and direction of the spout 45. When in the non-use position, the resilient member 24 extends away from the spout, such that the resilient member 24 abuts the handle portion 56, as shown in Figure 3.

[0020] In use during fueling, the resilient member 24 is placed in the use position and both the spout 54 and the resilient member 24 are urged into a fuel inlet 70 of a vehicle, as best shown in Figures 4 and 5. Due to the limited size of the fuel inlet 70, the resilient member 24 abuts a sidewall of the fuel inlet 70 and thereby acts to spring bias the spout 54 into contact with the sidewall of the fuel inlet 70. It will be understood that the bends that are provided in the resilient member 24 aid in spring biasing the spout 54 against the sidewall of the fuel inlet. Thus, friction between the spout 54 and the sidewall of the fuel inlet 70 and between the resilient member 24 and the sidewall of the fuel inlet 70 aids in inhibiting the spout 54 from inadvertently falling out of the fuel inlet 70 during fueling.

[0021] As previously explained, the resilient member 24 has ribs 44 that protrude and extend across the width thereof. These ribs 44 and the rounded bump 46 further aid in inhibiting the spout 54 from inadvertently falling out of the fuel inlet 70 as they protrude from the resilient member 42 and provide locations of increased resistance to removal of the spout 54 and the resilient member 24 from the fuel inlet 70. The third section 42 of the resilient member 24 also has a rounded bump 46 near an end thereof for screened tanks. This rounded bump 46 sits in the screen orifice when in use. Thus, the resilient member 24 contacts the fuel inlet and thereby provides electrical contact for grounding.

[0022] Once the spout 54 and the resilient member 24 are placed in the fuel inlet 70 of the vehicle, the vehicle is then refueled. To remove the spout 54 and the resilient member 24, the handle portion 56 of the nozzle 50 is grasped and pulled outwardly and away from the fuel inlet 70.

[0023] In the event that the fuel inlet 70 is not large enough to accommodate both the spout 54 and the resilient member 24, or the vehicle design does not permit both the spout 54 and the resilient member 24 to be inserted into the fuel inlet 70, the resilient member 24 is moved to the non-use position and fueling then begins. In the non-use position, the resilient member 24 does not inhibit the spout 54 from inadvertently falling out of the fuel inlet 70. In this case, however, the resilient member provides protection for part of the handle assembly 52.

[0024] The many features and advantages of the present invention will be apparent from the above description. Since numerous modifications and changes may occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation illustrated and described herein. Accordingly, such modifications and changes are believed to be within the scope and sphere of the present invention.